Appendix B
Engineer Equipment
Substitution Matrices

The matrices contained in this appendix illustrate some of the different equipment options available to scenario and order of battle developers. Although this organization guide provides a baseline of widely-used systems produced in the former Soviet Union (FSU), the intent of the capabilities-based OPFOR is to allow users to tailor their orders of battle by substituting other worldwide systems. Deviations from the baseline systems should relate to specific training objectives. For example, users may desire to mirror the actual mix of equipment found in a particular region or to introduce a particular capability or vulnerability.

The matrices list most of the major ***baseline*** engineer systems contained in the organization guide and provide a number of potential substitutes for each. While the lists of ***potential substitutes*** are not all-inclusive, they contain most common systems that have roughly ***comparable*** capabilities. They also contain some ***alternative*** systems that may perform the same missions (with greater or lesser capability) or have different capabilities for special uses. Entries include the system name and the digraph for country of origin. Entries within the alternative category also include one of the following symbols identifying each system's capabilities in relation to the baseline:

(+) More capable.
(-) Less capable.
(*) Different capabilities for special uses.

Users substituting systems from the matrices or considering other foreign weapons systems for use in an OPFOR order of battle should evaluate candidate substitutes against the same basic criteria as in Appendix A.

Amphibious Transporter and Ferry Substitution Matrix

Baseline Systems	Potential Substitutes	
	Comparable	Alternative
GSP Ferry (RS)	None	PMM-2 (RS)(+) M-2/-3 (GM)(+) PFM (FR)(+) BAC Automone 40/60 (FR)(+) 2TFR (IS)(+) Type-70 (JA)(+) Mobile Assault Bridge (US)(-)
PTS Amphibious Transporter (RS)	PTS-M (RS) PTS-2 (RS)	BAV 485 (RS)(-) K-61 (RS)(-) LARC (US)(-)
KEY: (+) More capable. (-) Less capable. (*) Different capabilities for special uses.		

NOTE: The greatest discriminator in capability here is whether the system could be autonomous or requires assembly with other sections.

Bridging Substitution Matrix

Baseline Systems	Potential Substitutes	
	Comparable	Alternative
TMM Truck-Launched Bridge (RS)	Truck-Mounted Scissors Tread-way Bridge (SR) AM-50 (CZ) GQL-110/Type-84 (CH)	Bundeswehr (FSB)(+) KMM (RS)(-) Type-81 (JA)(+) SMT-1 (PL)(-) Type 69 (CH)(-)
MTU-20 Tank-Launched Bridge (RS)	M48/AVLB (US) MT-55 (CZ) BLG-60 (GM) Biber Bridgelayer (GM) Yugoslav Tank-Launched Bridge (SR) Type 84 (CH) Type-67 (JA)	MTU-72 (RS)(+) BLP-72 (GM)(+) AMX-30/13 (FR)(+) Pz-68 (SZ)(+) Chieftain AVLB (UK)(+)
KEY: (+) More capable. (-) Less capable. (*) Different capabilities for special uses.		

NOTE: The main discriminator in capability here is the chassis. More modern, faster-moving, more heavily armored chassis improve mobility and survivability factors. However, the bridge specifications are all similar.

(continued)

Bridging Substitution Matrix (continued)

Baseline Systems	Potential Substitutes	
	Comparable	Alternative
PMP Heavy Folding Pontoon Bridge (RS)	Type 79 (CH) Type 74 (CH) M-71 (SR) Ribbon Bridge (US) PFM (FR) Folding Float Bridge (GM) DAF YGZ 2300 (NL) PR-60 (RO) PP-64 (PL)	None (All have fairly similar capabilities.)
KEY: (+) More capable. (-) Less capable. (*) Different capabilities for special uses.		

NOTE: The main discriminator in capability here is the chassis. More modern, faster-moving, more heavily armored chassis improve mobility and survivability factors. However, the bridge specifications are all similar.

Ditching and Trenching Machine Substitution Matrix

Baseline Systems	Potential Substitutes	
	Comparable	Alternative
MDK/MDK-2M/MDK-3M Ditcher (RS)	M1987 (CH)	None
BMT/BMT-3/BMT-4 Trencher (RS)	M1984 (CH)	TMK (RS)(-) PZM (RS)(-) Model 260 (CH)(-) Type 74 (CH)(-) SEE (US)(-) Case & John Deer Backhoe/Loader (US)(-) Matenin Trencher (FR)(-)
KEY: (+) More capable. (-) Less capable. (*) Different capabilities for special uses.		

NOTE:
1. For trenchers, the greatest discriminator in capability is chassis mobility. Only the BTM series and the M 1984 are tracked. The rest are all wheeled, which degrades mobility.
2. Unlike the other systems, the Case and John Deer systems do not have a rotary trencher but can still use a bucket or backhoe to make a trench, achieving the same results.

Minelaying Equipment Substitution Matrix

Baseline Systems	Potential Substitutes	
	Comparable	Alternative
PMR-3 Towed Minelaying Trailer (RS)	PZM-4 (RS) MLG-69 (GM) Type 73/GBL-120 (CH) FFV-5821 (SW) Yugoslav Towed Minelayer (SR) Barmine Minelayer (UK) Type-83 (JA) ST-AT/V (IT) M-57 ATMDS (US)	PMR-2 (RS)(-) M1985 (CH)(+) PM-16 (FR)(+)
GMZ Armored Tracked Minelaying Vehicle (RS)	MV-90 (CZ) M1989 (CH) M1991 (SR)	PM-11 (FR)(-) VZ-92 (CZ)(*)
UMZ Mine-Scattering Vehicle (RS)	Volcano (US) Istrice (!T) SAKR Mine-Dispensing System (EG)	Skorpion (GM)(+) Minotaur (FR)(+) GEMSS (US)(-) VZ-92 (CZ)(*) Spartan (UK)(+) M1993 (CH)(+)
KEY: (+) More capable. (-) Less capable. (*) Different capabilities for special uses.		

NOTE: For towed rninelayers, the main discriminator in capability is the ability to feed mines automatically, rather than manually. For self-propelled systems, the main discriminators are mobility and survivability.

Mineclearing Equipment Substitution Matrix

Baseline Systems	Potential Substitutes	
	Comparable	Alternative
DIM Vehicle-Mounted Mine Detection System (RS)	ML-1621 (GM) ML-1750 (GM)	MDV (SF)(*) VMMD (SF)(*) Road Runner Detection System (SF)(*)
MTK/MTK-2 Explosive Mineclearing Vehicle (RS)	MICLIC (US) AVLM (US) Type 762/GSL-111 (CH)	SAKR Mineclearing System (EG)(-) LWD Line Charge Attachment for Vehicles (PL)(*) Giant Viper (UK)(-) Plofadder Line Charge Attachment for Vehicles (SF)(*) Type 84 (CH)(*) SVO (CZ)(*) M1987 MRL (CH)(*) Type 81 MRL (CH)(*)
KEY: (+) More capable. (-) Less capable. (*) Different capabilities for special uses.		

NOTES:
1. The LWD, Plofadder, and Type 84 are not actually mineclearing vehicles, but rather attachments to mount on any designated vehicles, such as tanks.
2. Unlike the MTK and MTK-2, the SVO, M1987, and Type 81 do not use line charges, but rather dispense multiple explosive rockets into the minefield.

(continued)

Mineclearing Equipment Substitution Matrix (continued)

Baseline Systems	Potential Substitutes	
	Comparable	Alternative
KMT-4/KMT-6 Tank-Mounted Mine Plow (RS)	TWMP Track-Width Mine Plow (IS) EMP (UK) M1982 (CH) SADF Mine Plow (SF)	None (All have similar capabilities.)
KMT-5/KMT-7 Track-Width Mine Roller (RS)	PT-54/PT-55 (RS) TWMP & Roller (US) SADF Mine Roller (SF) RKM Mine Rollers (IS) D-5M (RO) Minvalt-1 (SW)	None (All have similar capabilities.)
KEY: (+) More capable. (-) Less capable. (*) Different capabilities for special uses.		

Armored Engineer and Route-Clearing Vehicle Substitution Matrix

Baseline Systems	Potential Substitutes	
	Comparable	Alternative
IMR Armored Engineer Vehicle (RS)	IMR-2 (RS) Steyr Pionierpanzer (AU) IWT (PL)	Grizzley (Developmental US)(+) AMX-30 Combat Engineer Tractor (FR)(*) Pionierpanzer-2 Dachs (GM)(*) Leopard-1 Armored Engineer Vehicle (GM)(*) CEV (US)(-) Type-67 (JA)(-) CET (UK)(-)
BAT/BAT-M Route-Clearing Vehicle (RS)	None	BAT-2 (RS)(+) M-9 ACE (US)(-) Type-75 (JA)(-) PKT (RS)(-) BKT (RS)(-) D-7/D-9 Dozer (US)(-)
KEY: (+) More capable. (-) Less capable. (*) Different capabilities for special uses.		

NOTES:
1. The BAT-2 can also carry a combat engineer squad.
2. The armored engineer vehicles for special uses (*) include specialty equipment such as augers and mine dispensers.
3. Among the route-clearing vehicles, the M-9 ACE, Type-75, D-7, and D-9 have no crane and are slow-moving. The PKT and BKT are wheeled vehicles with little armor.

Engineer Reconnaissance Vehicle Substitution Matrix

Baseline Systems	Potential Substitutes	
	Comparable	Alternative
IRM (RS)	IPR (RS)	TRI/MT-LB (PL)(-) SEV/M-113 (CA)(-)
KEY: (+) More capable. (-) Less capable. (*) Different capabilities for special uses.		

Tank-Mounted Dozer Blade Substitution Matrix

Baseline Systems	Potential Substitutes	
	Comparable	Alternative
BTU Dozer Blade (RS)	Type 653 (CH) RKM Dozer Blade (IS) ABK-3 (IS) UDK-1/UDK-2 (UK) M-8/M-9 (US)	None (All have similar capabilities.)
KEY: (+) More capable. (-) Less capable. (*) Different capabilities for special uses.		